CT DOCS
En 90
cb
Vol. 13; no. 7
Item 10B

Citizens' Bulletin

Volume 13 Number 7 March 1986 $5/yr.
The Connecticut Department of Environmental Protection

Conn. Documents

CONN. COLLEGE LIBRARY
APR 23 '86
NEW LONDON, CONN.

185 Million Years Ago...

...when great monsters walked the land.

Citizens' Bulletin

March 1986
Volume 13, Number 7 $5/year

Features

3 A Strange Menagerie
Richard Krueger
10 Dinosaur State Park
14 Waste-to-Energy
Toby Goodrich
20 Proposed Legislation
Thomas Gaffey
Tessa Gutowski
Elaine Korenkiewicz

Departments

2 The Wider View
7 Nature Notes
13 Groundwater
18 Bulletin Board
19 Trailside Botanizer
23 The Night Sky
23 Letters

Cover:
Original Art by
Michael D. Klein

Commissioner
Stanley J. Pac
Director Info & Ed
William Delaney
Editor
Robert Paier
Graphics
Rosemary Gutbrod
Composition
Caryn Alleva
Circulation
Olive Tyghter
Phone
566-5524

DEP Citizens' Bulletin
(USPS 041-570)

Published 11 times a year by the Department of Environmental Protection. Yearly subscription, $5.00; two years, $9.00. Second class postage paid at Hartford, Connecticut. Please forward any address change immediately. Material may be reprinted without permission provided credit is given, unless otherwise noted. Address communications to Ed., **DEP Citizens' Bulletin**, Dept. of Environmental Protection, Rm. 112, State Office Bldg Hartford, CT 06106

The Wider View

A Gentle Reminder of Impermanence

by Richard Krueger
Geologist, Office of State Parks and Recreation

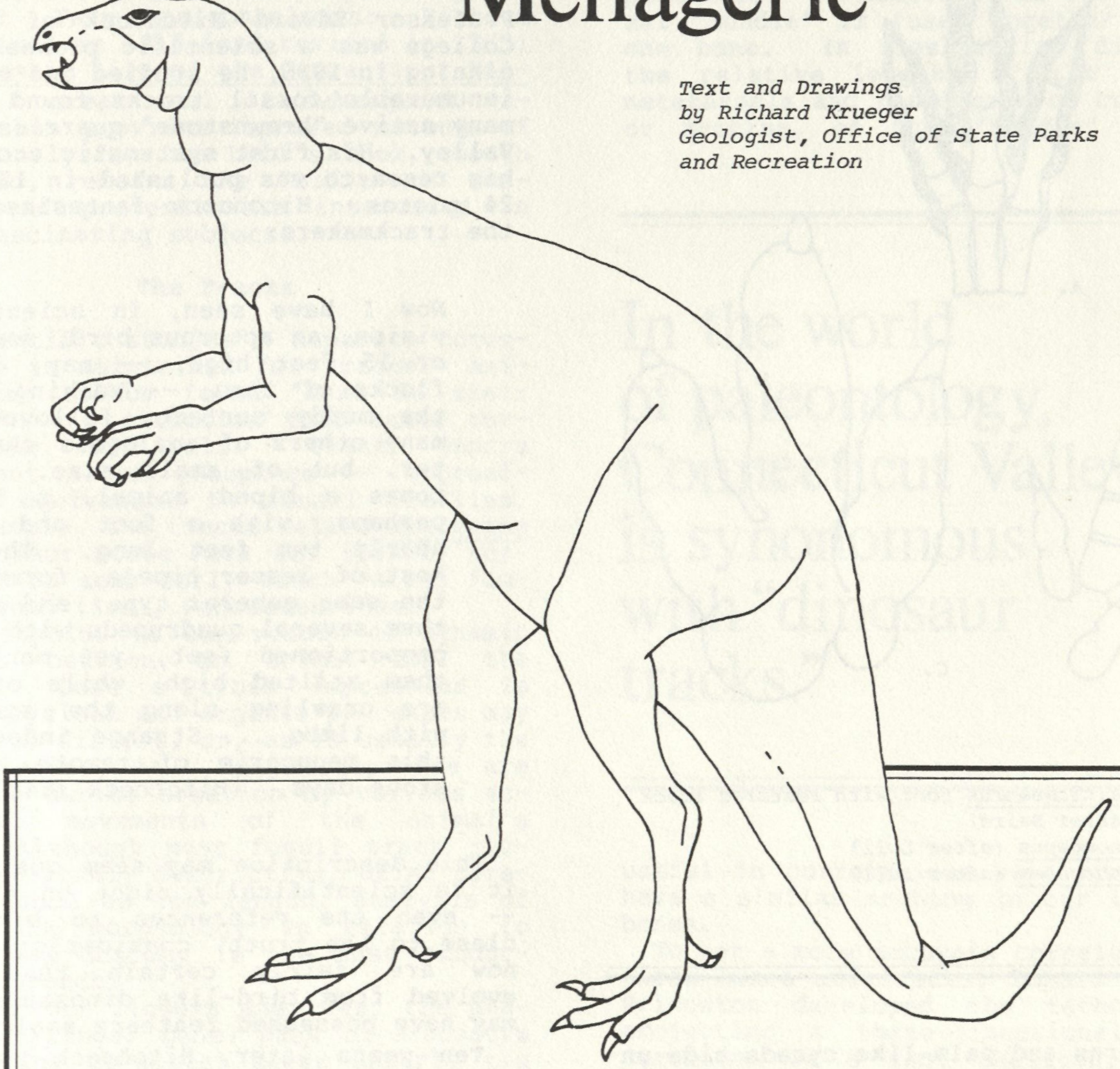
Dinosaurs seem to be more interesting than ever before. Not only are they a "hot topic" among scientists of many disciplines, but the popular media have made dinosaur stories and images almost commonplace. Noisy computer-animated models of dinosaurs at science centers and shopping malls are drawing record crowds.

For most dinosaur buffs, the fascination begins in the important developmental years of early childhood. The strange shapes and huge size of many dinosaurs calls to mind the dragons of fairy tales and, like the folklore monsters, they have a marvelously stimulating effect on our imagination and creativity (i.e., "Dungeons and Dragons"). But, unlike the mythical dragons, the dinosaurs have almost "magical" powers to stimulate scientific research. The current debate over dinosaur extinction has led physical scientists to predict previously unsuspected phenomena, like the Death Star and Nuclear Winter.

Both children and adults exercise their creative intellect in attempting to bring these creatures and the world they lived in back to life. This is why so many teachers encourage children to study dinosaurs and why they take them on field trips to places like Dinosaur State Park. Dinosaurs provide an educational springboard into a myriad of scientific concepts. For example, children learn that the seeming outlandish forms of some dinosaurs were functional adaptations to environmental conditions. They also learn that extinction may be the result of environmental change. Dinosaurs were once wonderfully alive and successful, like us. Now they are gone forever -- a gentle reminder of the impermanence of species, even our own. ■

A Strange Menagerie

Text and Drawings
by Richard Krueger
Geologist, Office of State Parks and Recreation

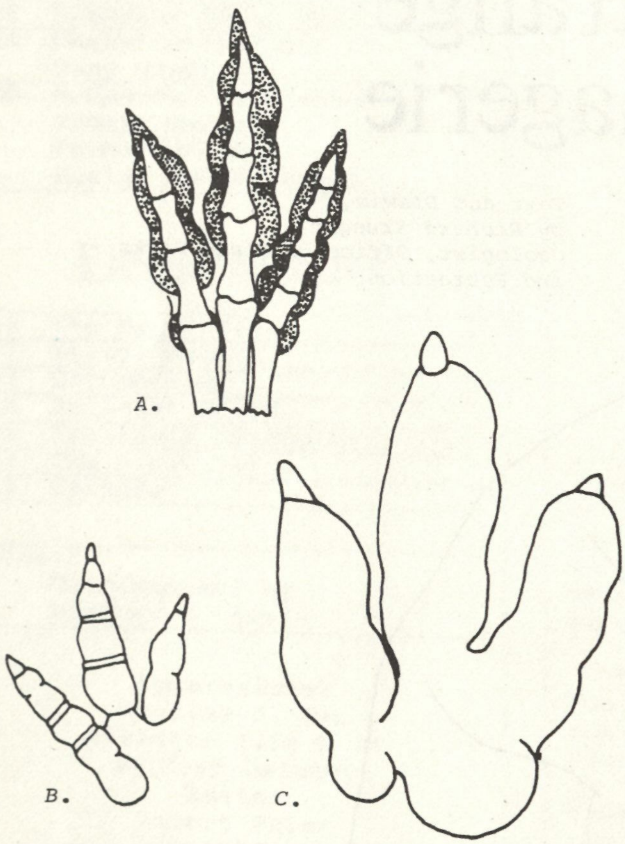


As you stand inches away from the spectacular dinosaur trackway exposed in Rocky Hill, your eyes and long-forgotten images may combine to deceive you. The sandstone has a soft, muddy appearance, and the shadow-deepened tracks look almost fresh. Vague but frightening scenes in technicolor are recalled. Your mind becomes a time-machine, trans-

porting you back to lost worlds where lush ferns and palm-like cycads hide unknown dangers.

These tracks, in Dinosaur State Park's recently completed Exhibit Center, are among the finest in the world. They are but a fraction of the 2,000 tracks uncovered on the Park site on a layer of 185-million-year-old gray sandstone. Fossil tracks of this quality and abundance are rare, a scientific treasure to be protected and proudly displayed. The new Exhibit Center serves both functions, and more. The world's first major on-site display of dinosaur tracks is appropriate for our state because, [illegible] the realm of world-wide paleontological discoveries, Connecticut Valley is synonomous with "dinosaur tracks." This is true because of the quality and diversity of track impressions, and also because of the work of two men who led the world in this area of scientific research.

What made the tracks?



A. *Halticosaurus* foot with restored track (after Baird)
B. *Anomoepus* (after Lull)
C. *Eubrontes* (after Lull)

Historical Perspective

Professor Edward Hitchcock of Amherst College was a scientific pioneer. Beginning in 1835, he studied and measured innumerable fossil tracks found in the many active "brownstone" quarries of the Valley. His first systematic account of his research was published in 1843 with 24 plates. Hitchcock fantasized about the trackmakers:

> Now I have seen, in scientific vision, an apterous bird, some 12 or 15 feet high, -- nay, large flocks of them, -- walking over the muddy surface, followed by many others of analogous character, but of small size. Next comes a biped animal, a bird, perhaps, with a foot and heel nearly two feet long. Then a host of lesser bipeds, formed on the same general type; and among them several quadrupeds with disproportioned feet, yet many of them stilted high, while others are crawling along the surface with limbs ... Strange indeed is this menagerie of remote sandstone days. (Hitchcock 1848)

This description may seem quaint, but it is scientifically right on the mark -- even the references to birds are close to the truth, considering that we now are fairly certain that birds evolved from bird-like dinosaurs which may have possessed feathery scales.

Ten years later, Hitchcock published his monumental Ichnology of New England, describing 119 track species from 38 locations and featuring 60 remarkable lithographic plates. His meticulous methods are outlined in a list of 31 separate parameters used in describing a set of tracks. By now he was aware of fragments of local skeletal materi[illegible] from large reptiles. But he would not add them to his list of trackmakers. Indeed, the fragments were from prosauropod dinosaurs -- their tracks have not been found in the Valley.

A large Supplement to the Ichnology, with excellent photographs, was published in 1865 shortly after his death. Hitchcock had so carefully laid the foundation for ichnological study that for many years fossil tracks from throughout the world, regardless of age, were identified almost solely by reference to his plates. The Connecticut Valley is still regarded as the classic track locality.

A major re-study and revision of the Valley's track fauna was prepared by the eminent Yale paleontologist Richard Swann Lull in 1915 (and revised in 1953) as Triassic Life of the Connecticut Valley. A great deal of subsequent research has provided improved methods of track analysis, but Lull's book, though outdated, remains the "bible" of amateurs and professionals interested in this fascinating subject.

The Tracks

In scientific studies a separate nomenclature is maintained for tracks. Animals are seldom found "dead in their tracks" -- a situation that makes correlations difficult. Track genera represent broad groupings -- approximately equivalent to faunal families. For example, the tracks called Eubrontes at Dinosaur State Park are loosely correlated to some early flesh-eating family groups (i.e., Podokesauridae).

A footprint is the result of dynamic contact between an animal and the ground. Once a track impression is made, physical and organic processes may preserve, distort, or, as is usually the case, destroy it. Many footprints are deformed during creation by various accidental movements of the animal's foot. Although most fossil track studies are purely descriptive, using parameters such as toe length, analysis of the track morphology in relation to functional anatomy is the most productive approach.

Unlike our fingers and toes, the phalangeal (finger bone) pads of dinosaurs and living cursorial birds underly the articular swellings at the joints. The arrangement of these callused sole pad marks in fossil tracks gives the form of the pedal skeleton. The sulci, or separations between pads, may have crease marks which aid in interpretation when pads are not distinct.

The individual toe bones (phalanges) of a single digit are numbered 1, 2, 3, etc., starting from the end closest to the body. The digits are numbered 1, 2, 3, etc., from the "thumb" (or big toe) to the little finger. In cursorial birds and flesh-eating bipedal (two-footed) dinosaurs, the gait is on the toes, with most of the weight falling on the joints between the first and second phalange of digits 2, 3, and 4. The "thumb" or first digit, like a 'dew claw', is not usually touching the ground, although in some birds it may extend backwards. The "heels" of tracks made by these dinosaurs are actually the pad marks beneath the joints between the foot bones (metatarsals) and the first phalanges. In modern birds the metatarsal "bundle" is fused together to form one bone. In flesh-eating dinosaurs, the relative lengths of the separate metatarsals and the degree of curvature, or arching, of the "bundle" is quite useful in correlations with tracks. We have a similar arching in our long foot bones.

In the world of paleontology, Connecticut Valley is synonomous with "dinosaur tracks."

To get a more accurate correlation between bones and tracks, Donald Baird of Princeton developed the technique of projecting a three-dimensional reconstruction of a foot skeleton, in the proper walking position, onto a horizontal plane representing the track surface. The outlined image of the bones is then properly foreshortened. Care must be taken to get the joints aligned for the correct range of motion.

Scientific Value

Even though most fossil tracks cannot be correlated with specific animals, they

Coelophysis

provide information about soft parts -- tissue, skin, scales, webbing, and even wing membranes in the case of pterodactyls.

Fossil tracks supplement our knowledge of the chronological and geographic distribution of vertebrates. They are often more abundant and varied than skeletal material. For example, track assemblages have been used to correlate rock units in New Jersey and Connecticut, and between Connecticut and South Wales. Assemblages of footprints are a population record and therefore can be used as data for paleoecological analysis.

Footprints provide evidence for dinosaur behavior, posture, and speed. For example, the huge sauropods, like *Brontosaurus*, were once thought to be too large to support their weight on land -- many scientists considered them to be aquatic, or at least amphibious. Trackways discovered in Central Texas provided indisputable proof that they were efficient upright walkers and suggested that they traveled in structured herds, like today's elephants. "Swimming tracks" found on the trackway at Dinosaur State Park provide strong evidence that several large carnivorous dinosaurs swam across the area, half submerged and pushing along the bottom with the tips of their toes. This sort of behavior might be expected, but this is the first evidence ever found.

Another important aspect of animal behavior is speed. Using various anatomical formulas based on living forms in conjunction with tracks, researchers have proposed methods for calculating the speeds of various dinosaurs. The estimated speeds tend to be comparable to mammals rather than reptiles.

So what do we really know about the scores of trackmaking beasts that once walked through Central Connecticut? Actually, very little. We're confident that the most common four-to-eight-inch, three-toed tracks of *Grallator* and *Anchisauripus* were made by the small, lightly-built, carnivorous ancestors of the birds: the coelurosaurs like *Coelophysis*. Perhaps the larger *Eubrontes* tracks were made by a large coelurosaur like the little-known *Halticosaurus* from Germany, or by some close relative of *Dilophosaurus* from Arizona, of which a magnificent life-size reconstruction is on display at the Park. The wider-spreading *Anomoepus* tracks were probably made by a plant-eating ornithopod and the huge, bizarre *Otozoum* tracks seem to have been made by an early crocodile relative.

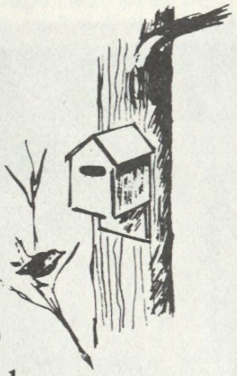
The poverty of good skeletal material from the Valley and other locations of the same age is in striking contrast with the riches of our tracks. Unfortunately, the physical conditions (i.e., climate, sedimentation rates) that are conducive to the preservation of tracks are poor for the preservation of organic remains.

So, much of the ancient life of the Valley is shrouded in mystery. Some of the tracks pictured by Hitchcock and Lull are so bizarre that they defy our wildest imaginings of possible animal forms. But there is a great pleasure in bringing them to life, and what fun it is to poke around in the rocky ledges of the Valley, knowing that at any instant you may uncover another member of this strange menagerie. ■

Nature Notes

A Backyard Haven

by Penni Sharp



Building a birdhouse can help preserve some favorite songbirds

March is upon us. Soon, the early wild flowers will push their way up through the brown earth and the first waves of returning birds will arrive.

Among my rituals of spring is the annual inspection of the bird houses. About the first of March, I set forth with whisk broom and brush to examine the various boxes that we have placed during the year. The task can bring some surprises. There may be a nest full of mice snuggled at the bottom of one of the boxes, or the paper cells of a hornet's nest attached to the roof. Sometimes there is the sad discovery of unhatched eggs, which leads to speculation about the fate of the nest builders. Were they unwitting prey to a neighborhood cat? Did the eggs overheat in the box? Whatever the answer, it is a disheartening find.

There are many things that one can do to turn the backyard into a hospitable environment for birds. The more diverse the landscape, the greater number of species will be attracted to the area. Because birds differ widely in preference for food and cover type, uniform areas tend to attract the fewest numbers of different species. Wooded areas draw the vireos and thrushes, while more open areas appeal to song sparrows, cardinals, mocking birds, and thrashers.

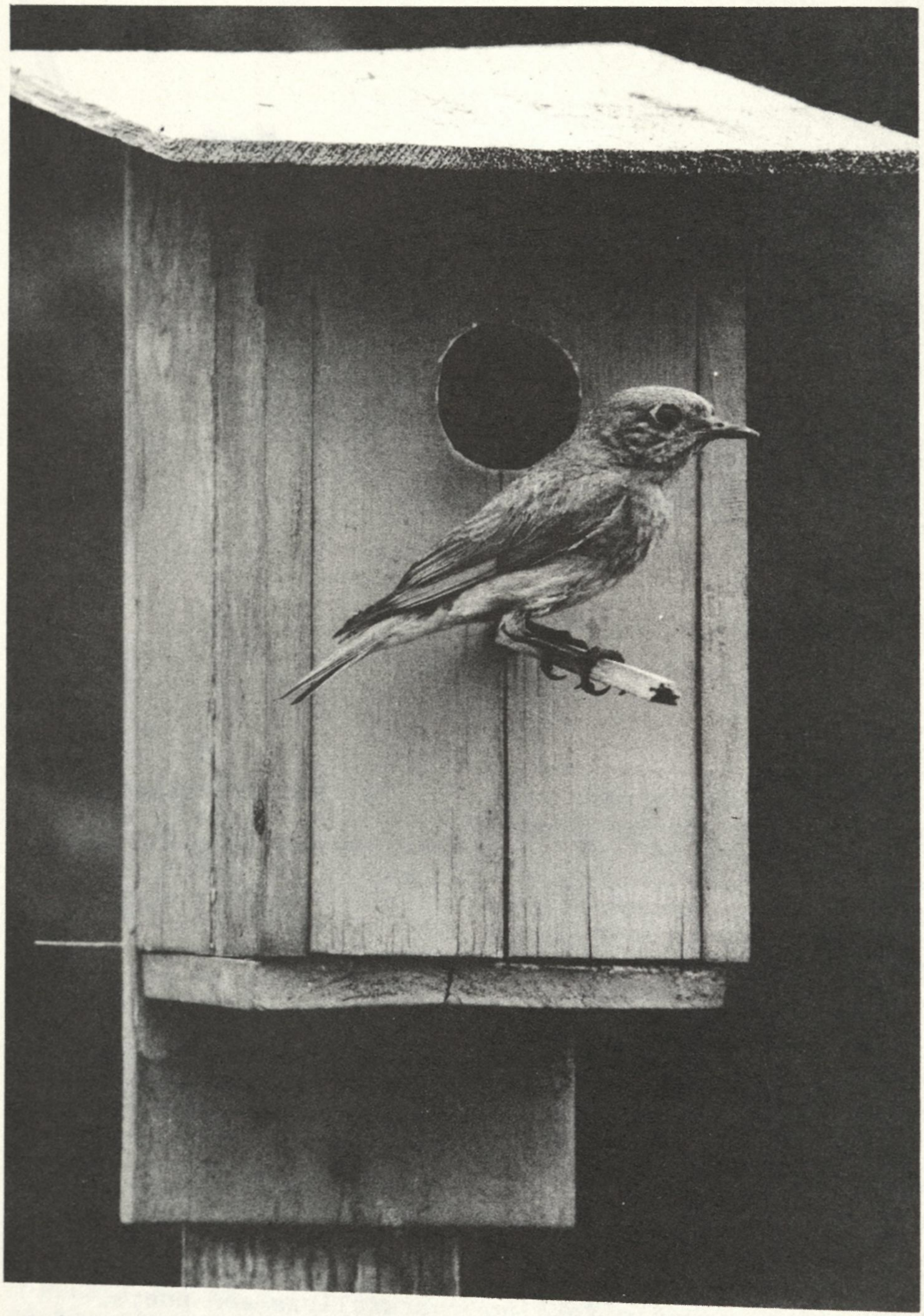
A source of water is also important, and property with a pond or stream will likely draw aquatic feeding birds such as herons, kingfishers, and ducks.

For anyone seriously interested in attracting birds, the placement of nest boxes around the yard should be considered. Although the great majority of birds select natural places to nest, there are approximately 50 species of American birds that will use a man-made structure for a nest site.

The Eastern Bluebird

Perhaps the favorite among these is the eastern bluebird (Sialia sialis). The bluebird, with its startling deep blue plumage, must be one of the handsomest birds of North America. Its popularity is well-documented during Colonial times and persists today. Early settlers were extremely fond of the bluebird, naming it "blue robin," as it reminded them of the English robin. It was noted as a sign of spring by many American naturalists and poets.

Bluebirds were once far more numerous than they are today and flocks of hundreds of birds were not uncommon. Today, flocks of 10 to 15 are the norm. Their decline is attributed to a combination of things. Chief among these is competition from non-native species, particularly the English house sparrow and the starling. These aggressive



A female bluebird perches at a nest box. *(Photos: L.L. Rue)*

birds will displace a bluebird from its nest. House wrens and tree swallows also compete with bluebirds for nesting habitat.

Land use patterns have had a negative impact on bluebird populations. Farm abandonment has resulted in the loss of open fields and fence posts, and the increasing development of rural areas has been detrimental to the bluebird.

Fortunately, since the extremely low population densities of the 1960s, the bluebird has been making a comeback. Programs to install nesting boxes around the state have brought positive results.

In early spring, the males arrive and proceed to select appropriate nest sites. Once the females have returned, the males begin the courtship, singing repeatedly and introducing the female to the selected nest site with various displays. Once the pair bond is established, nest building begins, with the female bringing the nest material to the cavity and fashioning the nest.

Two to three broods a season are usually reared, the first appearing in May. From three to six eggs are laid. The male is an attentive father and assists in the care and feeding of the young. If the female should die, male bluebirds have been known to raise the young singlehandedly.

Bluebirds usually remain together in family groups until the onset of cold weather at which time they migrate south. Overwintering flocks are not uncommon if the winters are not too severe and adequate food available.

For the highest potential for success in attracting bluebirds, the nest box should be built specifically for bluebirds, with an entrance diameter of 1 1/2 inches. It is best to place it on a post in the open at a height of about five feet. Be sure to provide for drainage and ventilation.

The House Wren

The easiest bird to attract to a nest box is the house wren (Troglodytes aedon). This jaunty little bird with its turned up tail is one of the most entertaining birds to observe. The rich, bubbling, and persistent song of the male announces his arrival. The males return slightly in advance of the females and begin to establish territory. This they do by singing loudly from several prominent perches and by placing nest materials in a number of possible nest sites. A male wren may start as many as seven dummy nests and will occasionally claim that of a neighboring male. Territorial disputes are common among these chunky little birds. Once the female arrives, the male launches into his courtship routines. There is a change in the song which becomes more high-pitched and squeakier. He leads the female from nest site to nest site. Courtship also includes displays such as tail fanning and flutter flights.

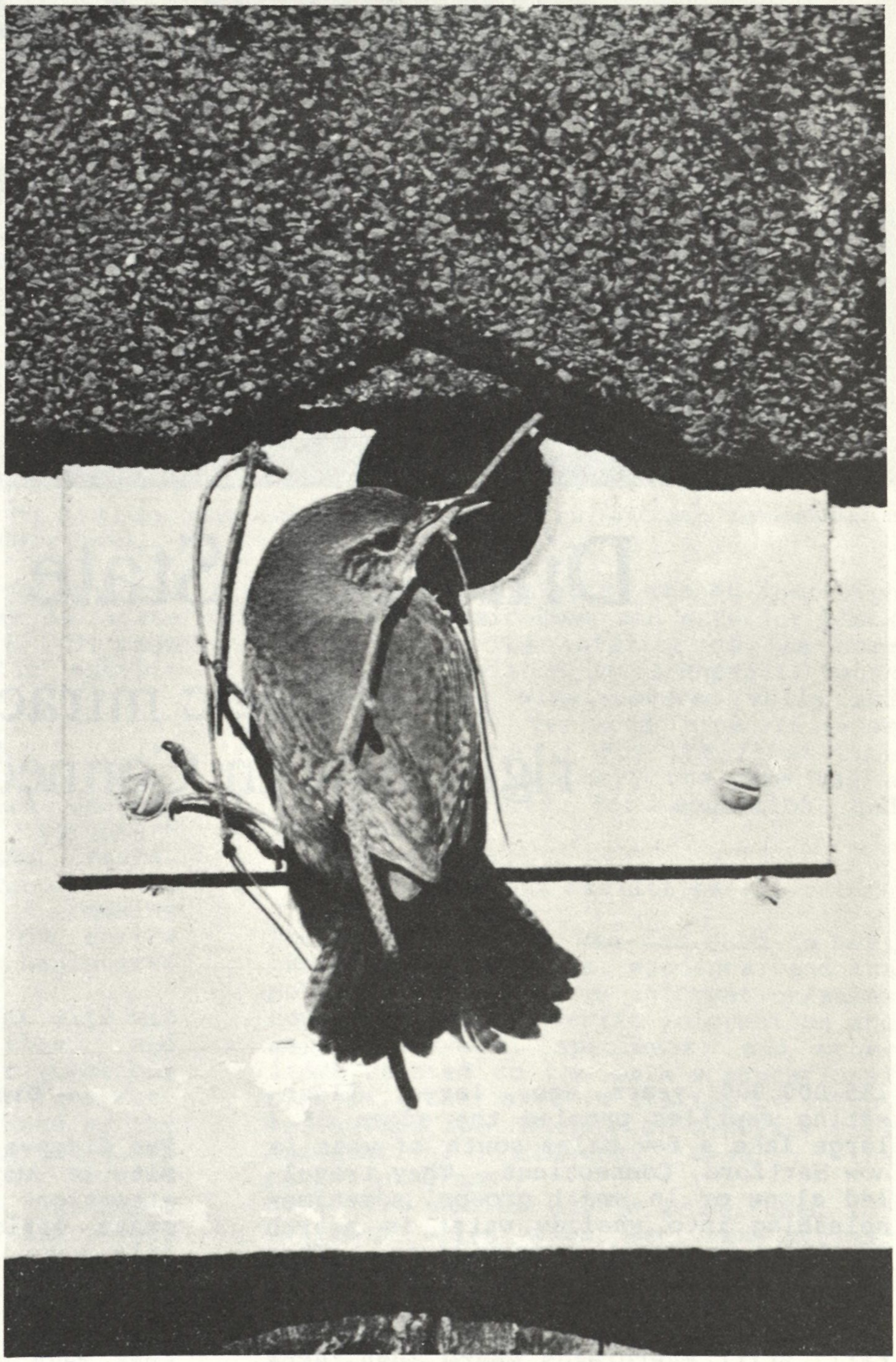
Once the female has selected the nest site that ost appeals, she will bring additional material and line the nest with soft grasses. The female alone incubates the eggs which usually number from four to six. The male will often bring food to the female while she sits on the nest. Wrens feed chiefly on insects and spiders.

While they will build in almost any bird box, wrens prefer a box with an oblong entrance hole measuring just under an inch by two and a half inches. It should be placed at a height of about six to 10 feet above the ground. The floor should measure four by four inches and the box be six to eight inches in depth. The boxes can be suspended from a tree or placed upon a post.

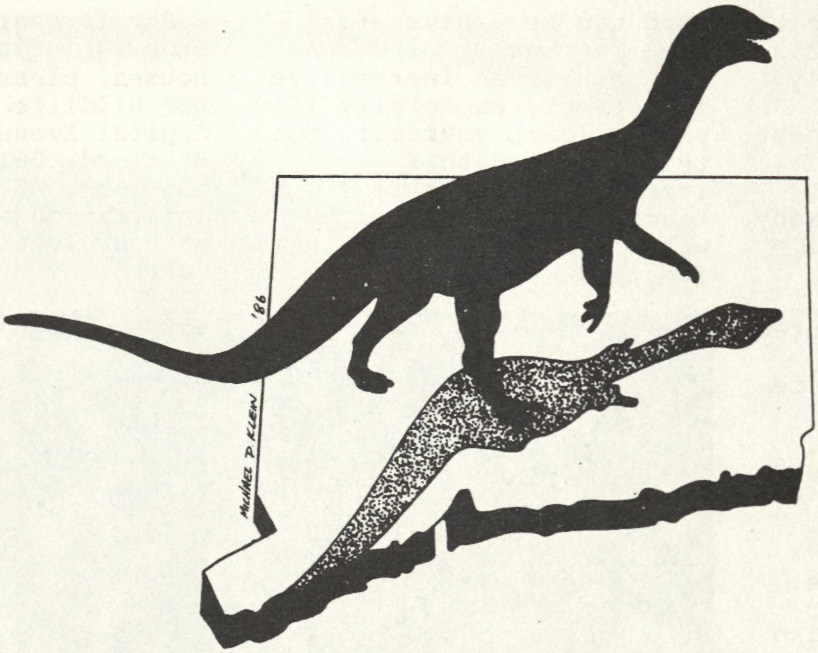
How to Start

There are many other birds that one might try to ttract by placing nest boxes or shelves around the yard. Obviously success will depend upon many factors, but even a small yard can be a haven for some species of bird. A nest box is an inexpensive investment, especially if you build it yourself, but the return on this investment may be many hours of pleasure as you watch the birds raise their families.

For further information on building bluebird houses, please contact the DEP Wildlife Bureau, 165 Capital Avenue, Rm. 254, Hartford, 06106, or phone 566-4683. Other information may be obtained at your local nature center. ■



A house wren brings a twig for its nest.



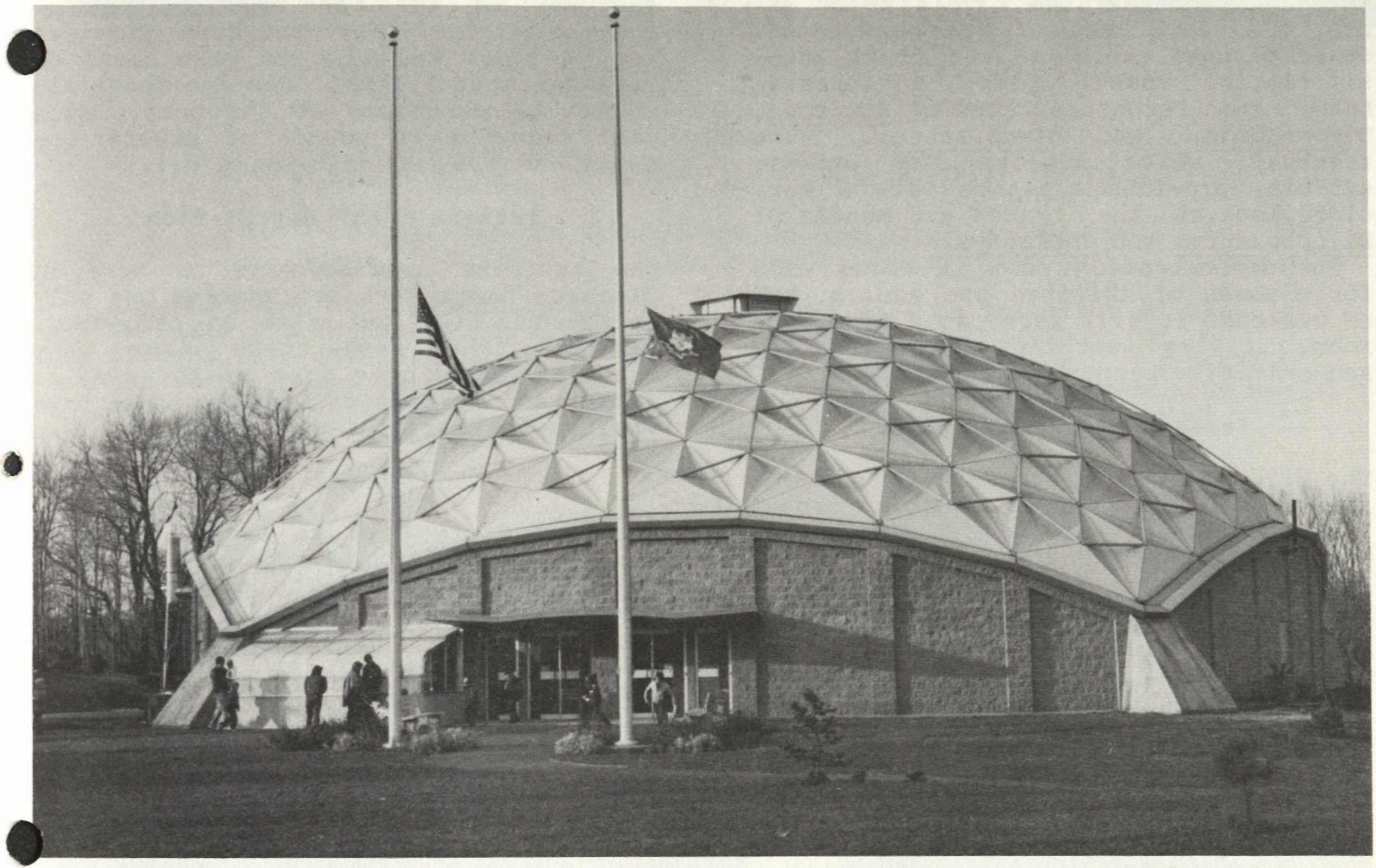
Dinosaur State Park

A geologic miracle right here in Connecticut

185,000,000 years ago, large, flesh-eating reptiles prowled the edges of a large lake a few miles south of what is now Hartford, Connecticut. They travelled alone or in small groups, sometimes splashing into shallow water in search of fish or small crocodilians. They crossed mudflats which glistened in the semi-tropical sun and rested in the upland forests of cycads, ginkgos, and tall, stiff evergreens where lush ferns hid their nervous prey.

Discovery of the Tracks

The discovery of dinosaur tracks at this site on August 23, 1966, attracted the attention of scientists, educators, state officials, and the media. Not only were these tracks extremely well preserved, but there was a great profusion of them on a single extensive layer of sandstone. The implication was that many animals crossed the area in a rather brief period of time. The tracks



The Exhibit Center at Dinosaur State Park was completed in 1984, with an auditorium, demonstration room, and sales shop. (Photo: Robert Paier)

in themselves were fascinating, and the fact that they were located on state property only a half-mile from I-91 made an ideal situation for public exhibition.

History of the Park

In 1968, Dinosaur State Park opened, with a temporary inflated structure housing over 500 of the 2,000 tracks. The larger, eastern portion of the trackway was recovered, as it remains today, for future display. The entire trackway was designated as a Registered Natural National Landmark.

The educational value of the site was recognized from the very first, and guides were on duty to answer questions and give tours. Nature trail construction began in 1970, and continued as the park grew in size to its present 40 acres.

Planning for a permanent geodesic structure began in 1972, but there were construction delays. In 1976, the temporary building was destroyed in a windstorm. In 1978, the Office of State Parks and Recreation announced the opening of Phase I of the Exhibit Center. This phase consisted of the 40-foot-high Temcore Geodesic Dome and exterior block walls only. The interior of the dome remained unfinished until Phase II began in 1984. Now vinyl-covered walls and carpeting have replaced pipe railings and gravel floors. For the first time in its 17-year history, the park has a finished facility for education and exhibition.

Present Facilities

The Exhibit Center was designed to meet the needs of tourists, students, and the public. The lobby's information/sales counter provides tourist information and sales of books, specimens, and other items related to the park's educational program. This area is staffed by volunteers from the Friends of Dinosaur Park Association. Proceeds benefit the park's programs.

The new auditorium is being used for visitors' orientation, lectures, movies, and other activities. The exhibit hall provides space for future permanent and temporary exhibits, including a large diorama depicting a scene in the Connecticut Valley in the late Triassic and early Jurassic Periods. This major exhibit is being donated by the Friends. Other planned exhibits are: track identification; fossil fish; a Jurassic Lake; and reconstructions of *Rutiodon*, *Dimorphodon*, and *Anchisaurus*. The trackway, which remains the primary exhibit, provides visitors with a very close look at the tracks and models of *Dilophosaurus* and *Coelophysis*.

The demonstration room is being used for classes of children and adults, and on weekends it will serve as a discovery room. Living reptiles, invertebrates, and primitive plants are on display.

Friends of Dinosaur Park

The Friends of Dinosaur Park Association is a non-profit, volunteer group organized to support the park's educational program through donations of exhibits, educational materials, and volunteer service. The Friends manage the park's bookstore.

Casting Your Own Tracks

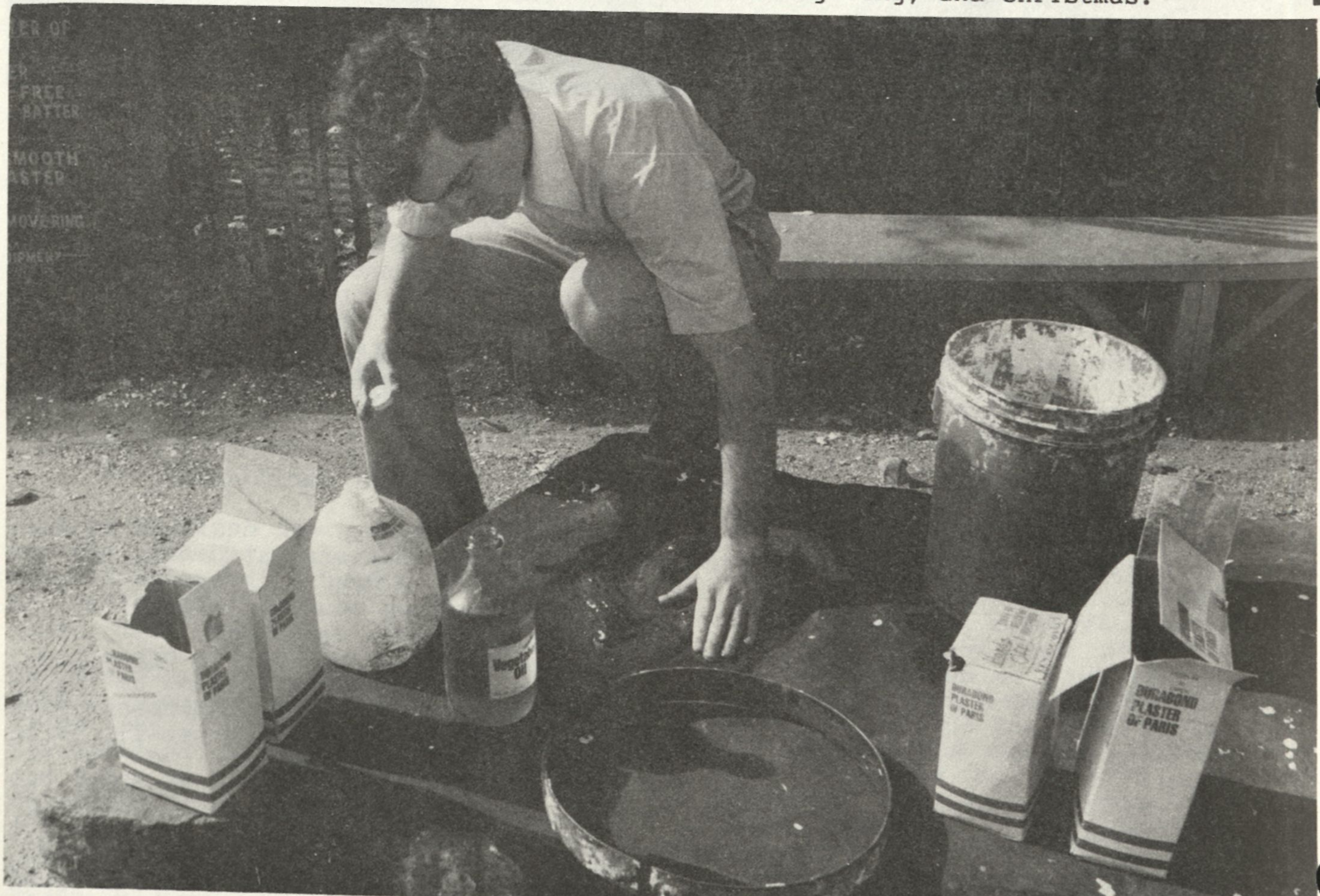
One of the most exciting and popular features of the park is the outdoor casting area. This has been provided for visitors who wish to make casts of real dinosaur tracks. Casting materials cannot be purchased at the park. Each cast requires 10 pounds of plaster-of-Paris and 1/4 cup of cooking oil.

International Recognition

The exhibits available to us here in Dinosaur State Park are special not only in Connecticut, but also in the world. Visitors and researchers from many countries have come from as far away as Japan, and as many as 50,000 people have visited the park in a single year.

How to Get There

Dinosaur State Park is located on West Street, one-half mile east of I-91 (Exit 23) in Rocky Hill. The park telephone number is (203) 529-8423. Hours of operation for the park are Monday-Sunday, 9:00 to 4:30, and for the exhibit center, Tuesday-Sunday, 9:00 to 4:30. The park is closed New Years Day, Thanksgiving, and Christmas. ■



Visitors who bring casting materials to the park are allowed to make casts of real dinosaur tracks. (File photo)

Groundwater and Your Town

What Your Town Can Do Right Now

by Jim Murphy, Principal Environmental Analyst, Water Compliance Unit

The DEP urges each community to initiate a groundwater planning process in order to examine present and future development and its impact on drinking water sources. The last step in this planning process will be selection of the most appropriate actions for groundwater protection. There are, however, actions every community can initiate immediately as part of this protection program.

In recent issues of the Citizens' Bulletin, the DEP expressed its position concerning the role of municipal government in groundwater protection. Basically, we believe drinking water protection is everyone's job, but local officials have a special responsibility equal to that of state environmental officials. We have concluded, quite simply, that the safety of drinking water supplies is the principal public health issue in any town.

As was explained in the February edition of the Bulletin, there are nonregulatory actions a town can pursue which may constitute the major part of a local groundwater protection effort. The following is a list of a few of those key activities.

I. Hazardous Materials Handling and Disposal

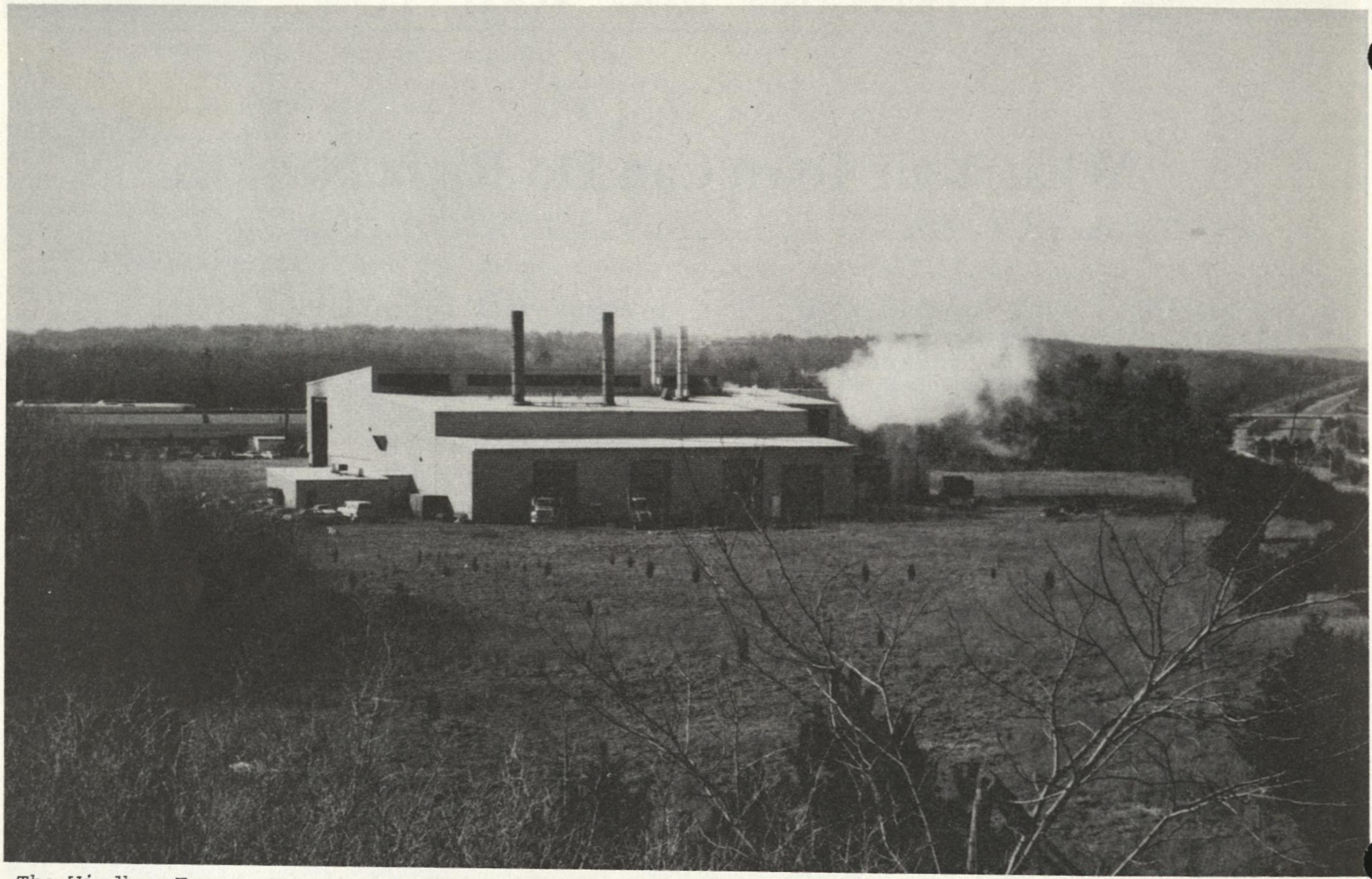
A. Household Hazardous Wastes. Every home contains material which can cause groundwater contamination, such as paints, solvents, cleaners, waste oils, and pesticides. Towns interested in conducting a collection day should contact either Glenn Goldsmith at 566-8843 or Leslie Lewis at 566-3489, both of the DEP.

B. Commercial and Industrial Establishments. Many businesses and industries store, use, and dispose of liquid and solid materials which can render groundwaters unsuitable for human consumption. Though the DEP stringently regulates all waste disposal from all businesses, we do not regulate the storage and use of many raw chemicals. The DEP's publication, "Protecting Connecticut's Groundwater," lists high-risk businesses and presents guidelines for local officials in addressing these potential pollution sources. A local building or health department can inventory the location and type of such businesses in a community and compare their chemical storage and use practices against those recommended in the groundwater guide. Technical assistance on how to develop an inspection program is available from Richard Mason of the DEP at 566-5903.

II. Land Use

A. Open Space Acquisition. Land in such uses as parks, forests, and certain agricultural pursuits pose a low risk to groundwater quality. Areas such as wetlands, flood plains, and unique natural areas also should be preserved to protect groundwater. Keeping these and other lands in open space will improve the recreational and scenic values of a town. Technical assistance in this area is available from the DEP Land Acquisition Unit at 566-2904, and from such private groups as the Connecticut Land Trust Service Bureau at 344-9867.

B. Education and Training. Because new laws, pollution sources, and development pressures seem to increase in number and complexity yearly, it is difficult to keep up to date. The UCONN Cooperative Extension Service conducts frequent seminars on such topics as groundwater protection and land use planning which are tailored for local officials, while the UCONN Institute for Public Service conducts mandatory specialized certification training for zoning and other enforcement officers. Towns should contact Don Francis of the Extension Service at 774-9600 and the Institute for Public Service at 486-2828 for their seminar schedules. ■



The Windham Energy Recovery Facility: A plume of steam rises from the cooling towers at the right.

Connecticut's Pioneers in Waste to Energy

Text and Photos
by Toby Goodrich,
Senior Environmental Analyst,
Solid Waste Unit

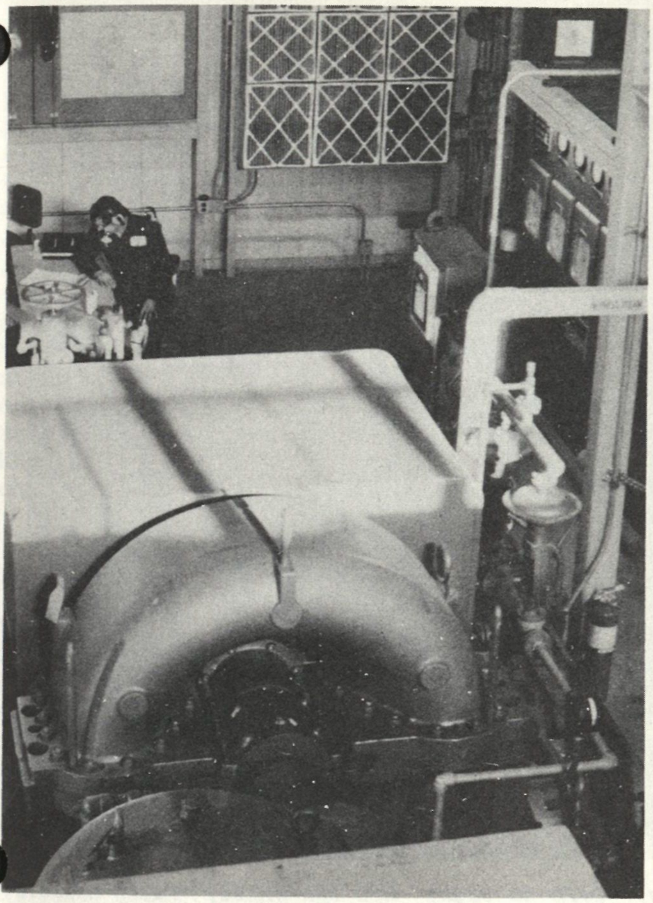
"We're not garbage people. We're an energy recovery facility. We are taking something that people have thrown away for years, wasted, buried, causing nothing but a multitude of environmental problems. We've taken that particular article, and we change it into energy. And we're producing electricity with it."

Don White, Superintendent, WERF

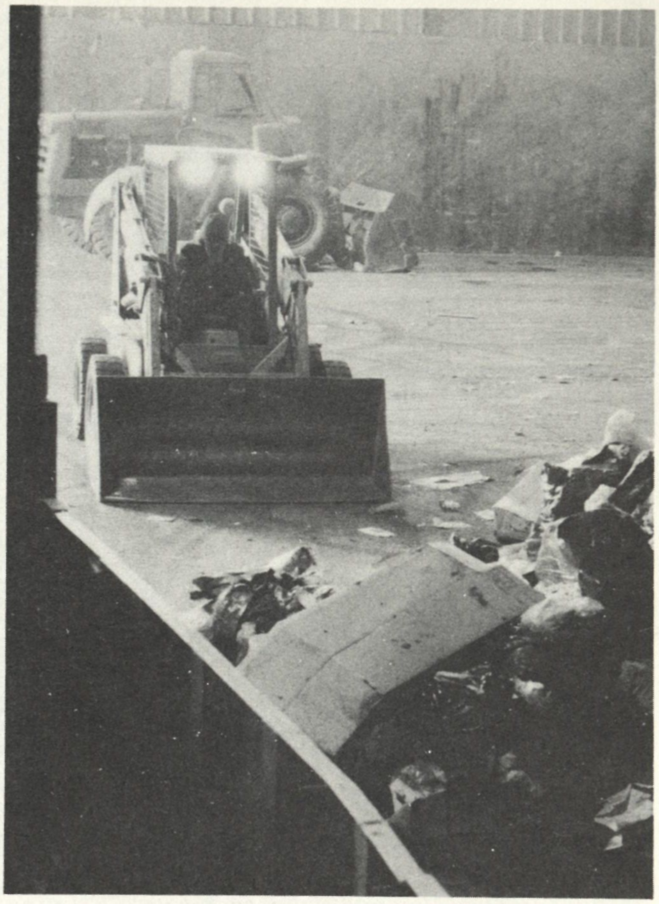
"It's not your normal job, because garbage is not a normal business. I enjoy it. I enjoy the adventure. We're sort of the Model-T, I think, of things to come."

Kathy Maxwell, Admin. Ass't., WERF

A handful of town employees, led by the former Director of Public Works, operate a sophisticated waste-to-energy plant in Windham, Connecticut. With ingenuity, pluck, will-power, and three Consumat furnaces, they manage to incinerate nine



Attendant Ken Brooks keeps close watch on the electrical turbine generator.



Loader operator Ricky Voss is one of the three furnace hoppers.

municipalities' trash and garbage every day, and to generate electricity in the process. The electricity is sold to Northeast Utilities, earning enough to pay around half the cost of running the plant.

For over 12 years, the DEP has spoken of the need for resources recovery from the waste stream in Connecticut. The folks in Windham decided, on their own, to embark on a specific project that would recover energy from their town's garbage while serving the waste disposal needs for eight other towns in the region. With a 70 percent construction grant from DEP, the plant was designed and built. The first waste was delivered to the plant in November, 1981, and the furnaces have been reliably on-line since then.

The Enlightened Alternative

From its earliest days, when it was only a gleam in the eye of Ray Smith of South Windham, a geology professor at Eastern Connecticut State University, WERF was to be established as an enlightened alternative to wholesale dumping of all waste onto the land. Waste disposal onto the land produces "leachate," a kind of garabage-tea brewed when rainfall percolates through the dump. In Willimantic, this tea flowed underground away from the dumpsite and into the city's drinking water reservoir. The town, agreeing with Mr. Smith and his "dump-the-dump" committee, sought to create an environmentally literate response to the situation (instead of another dump, farther from the reservoir).

Months of plant design followed, and a joint effort commenced to recruit enough garbage to fuel the plant. Windham's local government, the Windham Regional Planning Agency, engineers and planners from DEP, and Ray Smith found themselves in the peculiar position of requesting area towns to hand over their garbage. Countless night meetings were called at town halls in the region where amused citizens and their officials listened to persistent entreaties to send their trash to Windham.

Fortunately for WERF, enough towns have exhausted their landfills and suffered leachate pollution problems to commit sufficient trash to build the facility.

Some of the staff at the Windham Facility: Standing, left to right are Don White, Kathy Maxwell, Ricky Voss, Sal Misale, and Byron Lennox; seated, left to right are Tom Doubleday and Dennis Milhomme.

Early Obstacles

Today, WERF is staffed by 22 people, and the plant generates electricity 24 hours a day, seven days a week. It has not always been this smooth. During the first five years of operations, the plant was forced to deal with a serious obstacle.

The plant was designed and built in 1981 to serve the adjacent property-owner, Kendall Corporation, with saturated steam for Kendall's manufacture of non-woven fiber products. A 20-year contract was signed by representatives of WERF and Kendall Corporation. Kendall closed the plant and moved kit-and-kaboodle out of Windham about one year after WERF opened. With no more source of revenue, no buyer of steam, WERF was forced to dump its heat and to operate at a loss.

"With Kendall leaving and not bringing the tipping fee up where it belonged, we wound up in the red. And when we wound up in the red, we cut back on personnel. And when we cut back on personnel, we cut back on PM (preventative maintenance), and down the road, that cost us. In 1983 and '84 it started costing, because now we operated on a crisis basis. We were no longer acting, we were reacting. We had an unrealistically low tipping fee and no revenue."

Don White

WERF's crisis years, 1983 and 1984, were hard times for Superintendent Don White and Administrative Assistant Kathy Maxwell. Don, Kathy, and a crew of six kept the plant on line seven days a week. Deteriorating conditions in the ash removal system and no budget for preventative maintenance reduced WERF to an ailing trash incinerator operating at a loss. DEP issued an order to improve conditions at the plant. A local television station accused WERF of poisoning the air with dioxins. The debate about stack gasses from resource recovery plants continues to be given attention by DEP.

"You talk about being under siege. I had helicopters flying over the plant with cameras hanging out."

Don White

The Generation of Electricity

It took the town of Windham nearly three years to convert WERF from a producer of saturated steam to an electrical generating station. The know-how of the operations staff at the plant and determination on the part of the town were sufficient to salvage the facility. An agreement was made with Northeast Utilities to purchase the electricity (around one megawatt) from the new system of turbine-generator driven by superheated steam. The new generator went on line on the first of December, 1985. Day to day operations remain a challenge. WERF's people continue to rise to the challenge.

An Able Staff

"The problems here vary. You can go from hydraulic problems to steam problems, to loader problems, to conveyer problems. It's not one problem. It's a multitude of problems, and you have to adapt. But if you can't adapt, you have problems, and the plant goes down."

Don White

One of the people who have stood by WERF through fair times and foul is administrative assistant Kathy Maxwell.

"I've gotten to design my own job. When I was hired, they said, 'We want you to run the scale,' and that was the original thing I was supposed to do, as well as keep the tonnage figures. And they kept saying, 'Oh, she can do this,' and 'Oh, she can do that.' I just kept taking on everything."

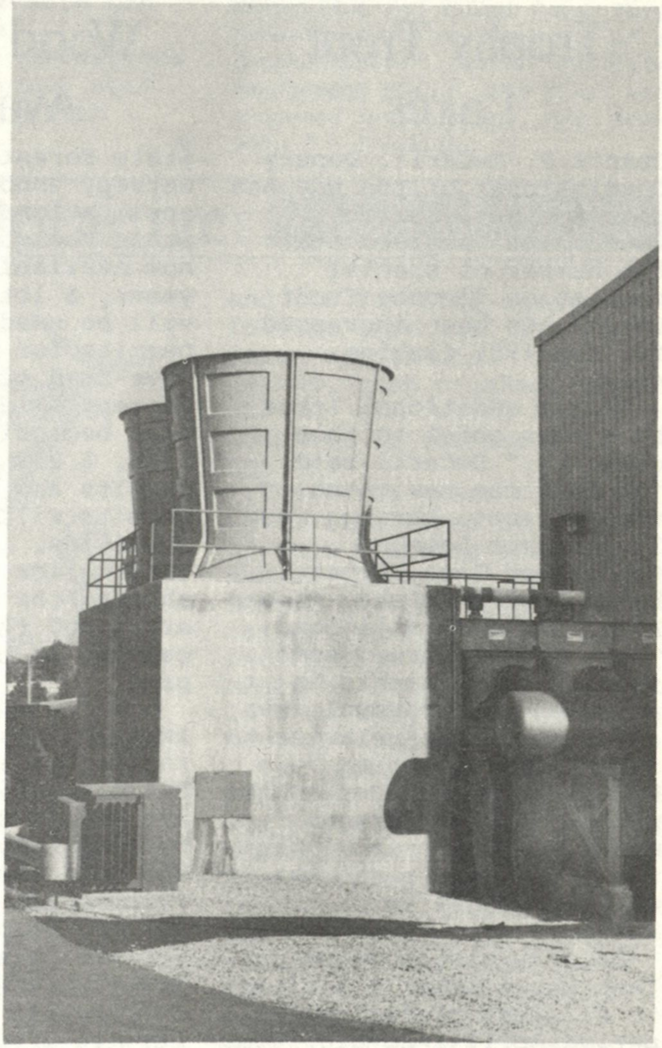
Kathy Maxwell

Plant Engineer Byron Lennox grew with the plant. Originally third shift foreman, Mr. Lennox put his experience to better use with his promotion. As plant engineer, he finds use for the knowledge gained from his practical experience on the floor and from his 21 years as machinist's mate in the Navy.

Also Navy-trained are the four turbine operators: Ken Brooks, Shaun Barrett, Les Parlin, and Mike Fagan. Between the four, there are 29 years of machinist's mate expertise on surface craft and nuclear submarines. The more earthy tasks of moving garbage from the tipping floor into the three furnaces, and seeing that the incinerators run smoothly, are directed by crew leaders Walt Swortzfigure, Tom Doubleday, Tom Leffingwell, and Dennis Milhomme. Working the floor are loader operators Felix Salgado, Sal Misale, Ricky Voss, Emil Chobot, Luis Orta, Al Mercure, Bob Brodeur, Fran Salgado, and Mike Henshaw. Also working first shift, and on call, are WERF's mechanic and electrician, Harry Labrecque, and Rich Galipeau.

Yankee Ingenuity at WERF

There is a sense of yankee ingenuity at WERF. Problems must be solved quickly, or a hundred tons of garbage moulders on the tip floor. With wrenches, welding equipment, and a few sworn oaths, the crew keeps the plant on line. WERF had developed its own schedule for preventative maintenance and its own inventory of spare parts. No consulting engineer's recommendations have stood the test of time and experience like the pragmatic conclusions reached by the operators of the plant. ■



The cooling towers, where steam is condensed back into feedwater for the boilers.

The Bulletin Board

Conservation Officer Robert Aborn was presented with the Shikar-Safari Wildlife Officer of the Year Award by Dr. C. Joseph Cross. Looking on is DEP Deputy Commissioner Dennis DeCarli.

Trophy Trout Lakes

Dennis P. DeCarli, Deputy Commissioner of the DEP has issued a reminder to Connecticut anglers that the number of special regulation "Trophy Trout Lakes" has been increased for the 1986 fishing season.

"Three additional lakes have been added to this category," DeCarli said. "Anglers can now catch trophy trout, through March 31, at Amos Lake, Candlewood Lake, Crystal Lake, Highland Lake, Rogers Lake, and West Hill Pond. There are, however, some special requirements in addition to the usual laws and regulations relating to inland sport fishing," DeCarli added. "During the period March 1 through March 31, the creel limit for trout is two and the minimum length is 15 inches."

DeCarli also pointed out that these lakes are closed to all fishing during the period April 1 to 6:00 a.m. on the third Saturday in April. ■

Wood Permits Available

State Forester Robert L. Garrepy announced that applications for the 1986 State Fuelwood Program are now available. "As in past years, a lottery system will be used to allocate permits for two-cord and five-cord cutting areas," Garrepy said. For the year beginning July 1, 1986, 1,039 two-cord permits and 520 five-cord permits will be available statewide. Application information includes a map showing the management areas and the number of permits to be issued by area.

Lottery applications and instructions are available in the State Office Building, 165 Capitol Avenue, in Hartford: the Bureau of Forestry, Room 260, and the Office of Information and Education Office, Room 112. Forms are also available at major DEP field facilities and at Cooperative Extension Service offices. Cards must be filled out completely and returned to Connecticut Bureau of Forestry, 165 Capitol Avenue, Hartford, CT 06106, no later than April 15, 1986. ■

Bird Conference

Connecticut forests and birds will be the focus of the Sixth Annual Connecticut Bird Conference to be held Saturday, April 19, 1986, at Central Connecticut State University in New Britain. The conference is sponsored by the National Audubon Society, Northeast Region.

Topics to be covered include Connecticut's state forest management program, the changing status of forest birds, how to find them, their critical habitat, and management requirements.

The highlight of the day will be the showing of national Audubon Society's new condor film, narrated by Robert Redford.

For further information, call (203) 364-0520, or write Patricia Bulson, Northeast Regional Office, National Audubon Society, RR1, Box 171, Sharon, CT 06069. ■

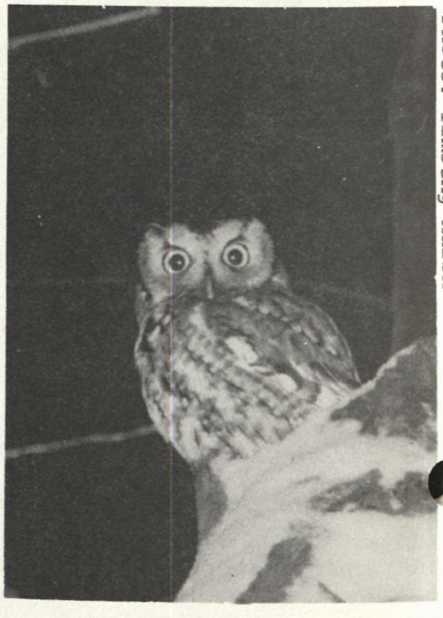


Photo: Timothy Marsh

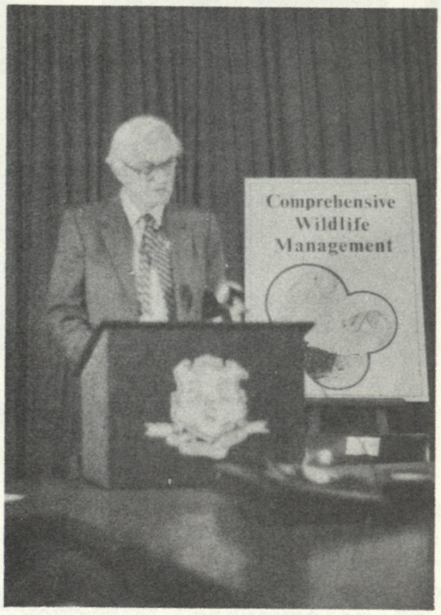
Conservation Teacher

Nominations are being accepted for the National "Conservation Teacher-of-the Year" awards program, according to Norma O'Leary, President of the Connecticut Association of Soil and Water Conservation Districts (CAS&WCD). The competition is open to all full time teachers working at the kindergarten through high school level who have developed an outstanding program of conservation education.

The National Conservation Teacher-of-the-Year will receive $1,000 in cash and an expense paid trip to Reno, Nevada, for the 1987 Annual Convention of the National Association of Conservation Districts (NACD). The national second place winner will receive a $500 cash award and the first place regional winner will receive $200.

Interested teachers can obtain additional information and nominations forms from the local soil and water conservation district. ■

"The Connecticut Department of Environmental Protection is an equal opportunity agency that provides services, facilities, and employment opportunities without regard to race, color, religion, age, sex, physical or mental disability, national origin, ancestry, marital status, or political beliefs."



Naturalist and author Roger Tory Peterson spoke on the value of a Comprehensive State Wildlife Management Plan. The plan was proposed by state Sen. Eric Benson, R - Franklin.

Trailside Botanizer

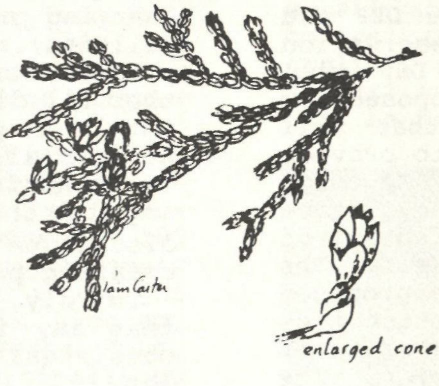
Northern White Cedar

by Gale W. Carter

Northern white cedar, or Arbor Vitae as it is often called, is a member of the Cypress family. It is a conifer, with all of its needles being scale-like and arranged very close to each other, and with many half-inch wooden, bell-like cones.

Most conifers have single needles or needles in clusters. Junipers are also in the Cypress family, but they have some needles that are prickly and they bear fruit which is berry-like.

Arbor Vitae grows best in limestone country or in wet acid bogs. In Connecticut, its distribution is largely limited to the Northern Marble region in the northwest part of the state. However, it is widely used as an ornamental in its many varieties.



Arbor Vitae is a medium-sized tree that may grow up to about 70 feet with a diameter of up to three feet. Its general shape is somewhat pyramidal and its fan-like sprays of foliage give the crown a dense appearance. The leaves, when crushed, give off an odor which has been compared to the smell of apples.

The words Arbor Vitae in Latin mean "tree of life," perhaps stemming from the use of the sap of the leaves by the Indians for curing scurvy. This information was passed along to Jacque Cartier in 1536 to help his crew to recover from scurvy.

The wood of Arbor Vitae also has an aromatic smell and resists decay. This at one time made it popular for shingles, and the Indians used it for their canoe frames. The stringy outer bark was used for tinder. It is currently used for poles, fence posts, and boats. Cedar oil obtained from the twigs is used in medicine. ■

© Gale W. Carter, 1986.

DEP's 1986 Legislative Proposals

by Thomas P. Gaffey,
DEP Executive Assistant
and Legislative Liaison

and

Tessa Gutowski
Senior Environmental Analyst
Water Compliance

Elaine Korenkiewicz
Wildlife Biologist
Wildlife Bureau

The DEP's 1986 legislative package, although smaller than those of past years, pursues a vigorous environmental agenda, particularly in the area of water pollution control. Of the 18 proposed bills, six have been submitted by the Environmental Quality Division of the DEP and 12 by the Conservation and Preservation Division. In addition, the DEP will strongly support a bill proposed by Governor William A. O'Neill that will establish a Clean Water Fund to provide for the financing of municipal sewerage needs. The DEP's highest legislative priorities in 1986 concern the waters of Connecticut and keeping them clean. The department has submitted three proposed bills dealing with water pollution control, enforcement and penalties of water statutes, and permits and orders. The following is an encapsulated summary of these proposals.

Environmental Quality

An Act Concerning Water Pollution Control. This proposal would allow the Commissioner of DEP to release information relating to trade secrets as they relate to the manufacturing processes of a discharger. This would guarantee the right of public scrutiny of the information which the Commissioner of DEP considers in determining permits and enforcement actions. Such information would include the water pollution control permits, permit applications, and effluent data.

Secondly, the proposal would eliminate an existing statutory permit exemption for those discharges which began discharging prior to 1967 (1973 for municipalities). This makes Connecticut's program consistent with federal law in that all discharges would be required to obtain a permit and allow the DEP to monitor all discharges and their effect on Connecticut waters, rather than having to track down those non-permitted discharges which might be causing or creating pollution.

Thirdly, this proposal would require that any issuance of a permit must be consistent with the federal Clean Water Act.

An Act Concerning Violations of Water Pollution Statutes. This proposal expands the civil forfeiture provision of the water pollution chapter of Connecticut statutes to cover violations of the Commissioner's power and cease and desist orders. This amendment would make the criminal and civil penalty provisions under this chapter consistent. Within this same section, this bill would double the existing maximum penalty upon a second conviction of a violation of a water pollution statute and make responsible corporate officers liable for criminal penalties.

In addition, this proposal makes clear that the penalties in the same section of the statutes for false statements apply per violation. This amendment would make this section of our water pollution statutes consistent with federal law.

An Act Concerning Permits and Orders. This proposal makes the Commissioner's authority to require a system for the monitoring of a discharge explicit. It also makes explicit the Commissioner's authority to consider the past compliance of a discharger when determining the issuance of a permit. The bill also requires the Commissioner to delegate to all municipalities the authority to issue permits for discharges to municipal sewerage systems of wastewater from vehicle service area floor drains and domestic sewerage. Currently, municipalities operating sewerage treatment plants do so under a DEP permit which allows them to approve sewer connection. The need for additional DEP approval is unnecessary.

These three proposed bills have been submitted to preserve and protect the quality of Connecticut's waters and broaden the authority of the Commissioner in fulfilling this charge. The DEP has agreed with the federal Environmental Protection Agency that many of these proposed statutory changes are needed so that our water statutes become consistent with federal law. The primary objective of these proposals, however, is that the Commissioner may better scrutinize the discharges into Connecticut's waters to ensure that the quality of our natural resources and the public health and safety is not compromised.

Clean Water Fund. The DEP will also be supporting a bill proposed by Governor O'Neill which will establish a revolving loan program to provide 100 percent of water quality project costs to municipalities for construction of water quality projects. This program, to be known as the Clean Water Fund, will provide financing to municipalities to address water quality problems which require greater levels of sewerage treatment, connection of combined sewers in some cities, and the construction of new sewerage systems for small towns.

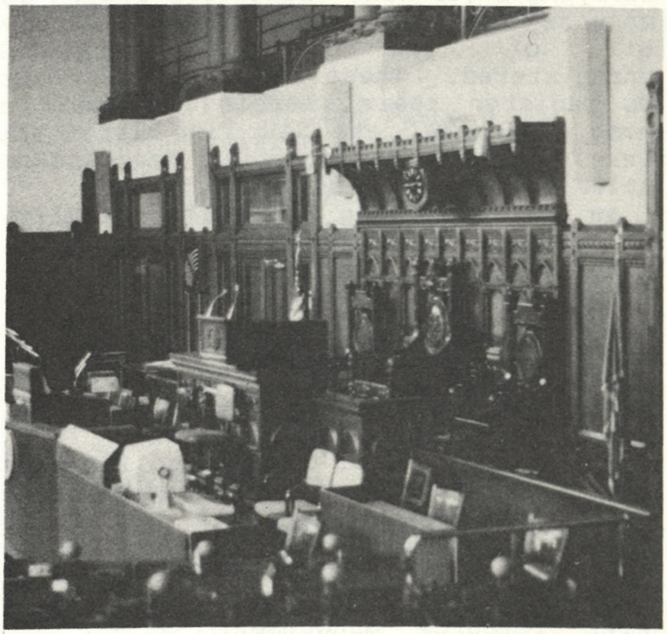
The state will provide financing at two percent interest to the municipalities, a rate far below what they could obtain on their own. The state's contribution to the fund will be 40 million dollars per year until it can operate solely through the municipal repayments.

Considering the diminishing availability of federal dollars that will ultimately cease as a result of the Gramm-Rudman Bill, this fund provides the state of Connecticut with an alternative long-term plan to achieve the state's water quality goals for the next 20 years and relieves our municipalities of a great financial burden. With this program, by 2005 all of Connecticut's waterways should meet the state's goal of fishable, swimmable waters.

An Act Concerning Safety Inspection of Dams. This proposal would exempt low hazard dams from mandatory state inspections subsequent to an initial inspection. This would allow DEP's Dam Safety Inspection staff to concentrate on those dams which pose a significant hazard to life and property.

An Act Concerning the State's Hazardous Waste Management Program. This proposal will eliminate any possible confusion that Connecticut needs federal EPA approval of any civil or criminal actions the state may choose to pursue. The bill also clarifies the Commissioner's authority to adopt regulations to include 1984 Resource Conservation Recovery Act amendments.

An Act Concerning a Change in the Name of the Interstate Sanitation Commission to the Interstate Environmental Commission. Conecticut, New York, and New Jersey are parties to the Tri-State Compact as established by a federal act of Congress. The Commissioner has submitted this bill to all three state legislatures so that the name of the Commission may better reflect its duties which entail administering a water pollution control program and an interstate air quality program. Subsequent to the states' approval, Congressional approval will be necessary.



The DEP will keep a keen eye on bills that affect the environment

Conservation and Preservation

DEP's Conservation and Preservation Division has set Boating Safety as its highest legislative priority. **An Act Concerning the Operation of a Vessel Under the Influence of Intoxicating Liquor** provides specific standards, improves procedures and meaningful penalties for the enforcement of a current state statute which states that "No person shall operate a vessel while under the influence of intoxicating liquor or drugs." This bill provides for blood and breath tests, defines blood alcohol levels, requires blood tests in fatal boating accidents, and increases penalties. As the next priority, the C & P division would like to increase the fines for those persons who fail to register their vessels. **An Act Concerning Penalties for Unregistered Vessels** would expand the penalty provision so that each subsequent offense will be subject to a fine of up to $500. In 1985, officers of the Marine Patrol Division of DEP discovered 596 vessels which had failed to register as required by law. Although all violators were issued notices of infractions carrying a $40 fine (some were issued as many as three and four notices), nearly all of the vessels remained unregistered. These boat owners refuse to register their vessels because, in most instances, the $40 fine is a lot less than the registration fees and/or sales tax on new vessels.

An Act Concerning the Confidentiality of Reports Submitted by Fur Buyers, Trappers, and Taxidermists has been submitted to increase the accuracy of necessary harvest data to determine the impact of the harvest season on furbearer populations. This information is needed for making proper management decisions concerning these species.

An Act Concerning Closed and Extended Open Seasons for Regulated Species would allow the Commissioner to declare a closed season or extend an open season for the taking of regulated species by sport fishing, hunting, or trapping to meet resource management objectives. Often circumstances beyond our control, such as weather conditions or fores fires, warrant this.

An Act Concerning Voluntary Registration for Loggers and Foresters would require the Commissioner of DEP to establish a voluntary registration program for loggers and foresters practicing in Connecticut in order to promote better management of the harvesting of Connecticut's woodlands.

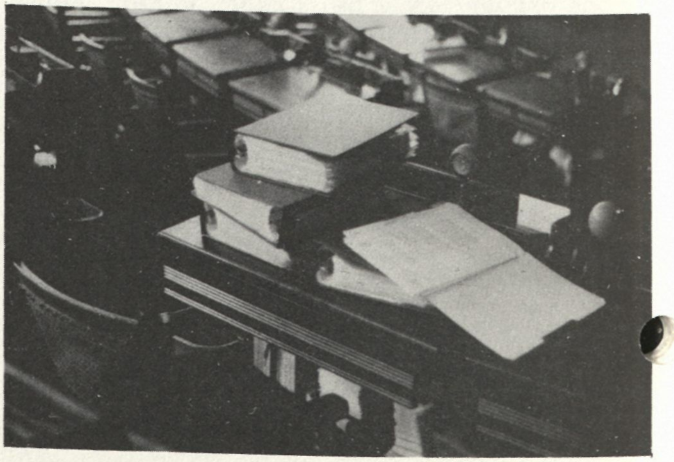
An Act Concerning the Penalty for Failure to Stop a Vessel would increase penalties for boat operators who not only fail to regard and obey the signal of an officer, but also who engage a marked law enforcement vessel in pursuit.

An Act Concerning the Powers and Duties of Conservation Officers will authorize DEP conservation officers to enforce statutes concerning dangerous weapons and falsely reporting an incident.

Additional C & P division bills would expand the authority of certain town marine officers; make the murder of a DEP conservation officer a felony; clarify statutory authority between the Commissioner of DEP and the state Commission on Fire Prevention and Control; provide for a minimum age limit for operating motor boat with the on-board supervision of a parent or guardian; and provide for the management of horseshoe crabs and sea sturgeon.

An Interesting Session

There will be numerous bills filed this session which can impact Connecticut's environment. DEP will watch all these bills with a keen eye and take positions, pro or con, on those bills that will either add to the quality of our environment or act to the detriment of that quality. We look forward to an interesting session. ■



The Night Sky

Buy the Right 'Scope

by Francis Downey

For many people, the return of Comet Halley has kindled an interest in astronomy. Thousands of people will be rising to observe the comet an hour and a half before sunrise in March and April. Many of these observers have, or will purchase, equipment to see Halley. There are, however, a couple of things to keep in mind when making such purchases.

There are essentially two types of telescopes: refractors and reflectors. A refractor uses a lens to collect light and bend it to a point of focus. A reflector uses a curved mirror to collect and reflect the light to focal point. Refractors tend to be more common because they are usually more compact and easily maintained.

A third type, the folded optic telescope, uses a combination of lenses and mirrors to collect and focus light. Although folded optic instruments are more expensive than refractors or reflectors, they are usually of very high quality and are extremely portable.

Whether you choose a refractor or a reflector, the most important feature is the size of the objective lens or mirror. The objective gathers light and focuses it to a point. So, the larger the objective, the more light it can gather and the higher the magnification power. A good rule of thumb is 50 power for every inch of objective lens. A three-inch telescope is capable of magnifiying an object 150 times.

When making observations with a telescope, you will notice that you can only see a small portion of the object. This is because a telescope has a narrow field of view. To see the entire comet, binoculars are needed. In fact, many comets have been discovered by amateur astronomers using binoculars.

You'll notice that binoculars have two numbers separated by an "x." The first number is the magnification power of the binoculars, and the second is the diameter of the objective lens. For astronomical purposes, one of the best types of binoculars are 7x50. These have an objective lens 50 millimeters in diameter, and will magnify the object seven times.

Whether you purchase a pair of binoculars or a telescope, it is important to take proper care of the instrument. Always cover the lens or mirror with a dust cover, and never use a liquid cleansing fluid on the lens. If you take care of your optical instrument, it will give you a lifetime of enjoyment. ■

Letters to the Editor

Still not up to the quality of the Conservationist, published by the New York Department of Environmental Conservation.

Walter L. Buckie
Higganum

Well, you're probably right.

Ed. ■

The Bulletin is improving every year.

Mrs. Agnes Dubin
Hartford

Have used a couple of articles in my son's school class for reports. There are such wonderful articles on wildlife. We enjoy the whole Bulletin.

Erwin Burr Jr.
Higganum

I would like to know more about Sheffield and Chimon Islands -- where to moor my small boat, am I allowed to walk around and take snapshots, etc?

Michael A. Zyara
Stamford

Sheffield and Chimon Islands are both open for brief mooring, walks, and photo taking. Chimon Island, however, is closed to all visitors during the nesting season, which extends roughly from May to July. For further information, contact Jim Munson, Assistant Refuge Manager, U. S. Fish and Wildlife Serv., Federal Building, Rm. 210, 915 Lafayette Blvd., Bridgeport, CT 06604, or phone (203) 579-5617. Ed. ■

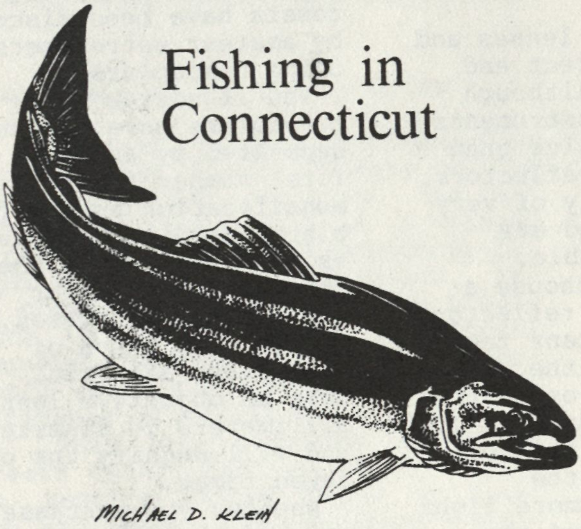
Endnote

"We have found a strange footprint on the shores of the unknown. We have devised profound theories, one after another, to account for its origin. At last we have succeeded in reconstructing the creature that made the footprint. And lo! it is our own."

Arthur Eddington

Next Month's Bulletin

Fishing in Connecticut



A great gift for a fisherman.

Please send a Citizens' Bulletin subscription to:

NAME: ______________________

____

ADDRESS: ______________________

TOWN: ______________________

STATE: ______________ ZIP: ________

__$5/1 yr __$9/2 yrs

NAME: ______________________

ADDRESS: ______________________

TOWN: ______________________

STATE: ______________ ZIP: ________

__$5/1 yr __$9/2 yrs

DEP Citizens' Bulletin
165 Capitol Ave., Rm. 112
Hartford, CT 06106

Gift card to read from: ______________________

____

SECOND CLASS POSTAGE PAID
AT HARTFORD, CONNECTICUT

DEP Citizens' Bulletin
State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06106